

**ABSTRACT OF THE DISCLOSURE****APPARATUS AND METHOD FOR STEP-STABILIZATION OF GMR-BASED  
READ SENSORS**

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An apparatus and method for step-stabilization of giant magnetoresistive (GMR) based read heads are provided. With the apparatus and method, gratings or periodic structures are generated in the underlayer of the magnetoresistive (MR) sensor stack and the edges, or "steps", in these structures are the magnetically active features. These "steps" are oriented approximately parallel to the desired bias direction and provide a restoring force towards the bias direction for any perturbations, whether intrinsic or extrinsic. In the case of a GMR sensor, where the easy axis is parallel to the permanent magnet set direction, these stabilizer steps are oriented parallel to the magnetization direction of the permanent magnets.